
June 25, 2002



Information Technology

Defense Hotline Allegations
Regarding the Military Airspace
Management System
(D-2002-119)

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Acronyms

FAA	Federal Aviation Administration
FACSKED	Fleet Air Control & Surveillance Scheduling
MAMS	Military Airspace Management System
SAMS	Special Use Airspace Management System
SUA	Special Use Airspace



INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
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June 25, 2002

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE (COMMAND, CONTROL,
COMMUNICATIONS, AND INTELLIGENCE)
ASSISTANT SECRETARY OF THE AIR FORCE
(FINANCIAL MANAGEMENT AND COMPTROLLER)
NAVAL INSPECTOR GENERAL
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Audit Report on Defense Hotline Allegations Regarding the Military Airspace
Management System (Report No. D-2002-119)

We are providing this report for your review and comment and to obtain a statement of actions to be taken. We performed the audit in response to Defense Hotline allegations concerning the effectiveness and efficiency of the Military Airspace Management System. We considered management comments on a draft of this report when preparing the final report.

DoD Directive 7650.3 requests that all recommendations be resolved promptly. Management comments were not fully responsive to Recommendations A.1. and B. We request that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) provide comments including action plans and completion dates for implementing Recommendations A.1. and B. by July 25, 2002. If possible, please provide management comments in electronic format (Adobe Acrobat file only). Send electronic transmission to the e-mail addresses cited in the last paragraph of this memorandum. Copies of the management comments must contain the actual signature of the authorizing official. We cannot accept the / Signed / symbol in place of the actual signature.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. Harold C. James at (703) 604-8983 (DSN 664-8983) (hjames@dodig.osd.mil) or Ms. Eleanor A. Wills at (703) 604-8987 (DSN 664-8987) (ewills@dodig.osd.mil). See Appendix G for the report distribution. The audit team members are listed inside the back cover.


Thomas F. Gimble

Acting
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Office of the Inspector General of the Department of Defense

Report No. D2002-119

June 25, 2002

(Project No. D2001AD-0187.00)

Defense Hotline Allegations Regarding the Military Airspace Management System

Executive Summary

Who Should Read This Report and Why? DoD personnel who develop Information Technology systems and users of the Military Airspace Management System (the System) should be interested in the progress of the program. The report discusses Defense Hotline allegations regarding the System as well as the use and acceptance of the System within DoD.

Introduction. This audit resulted from Defense Hotline allegations on the System. Specifically, the Defense Hotline complainant submitted seven allegations relating to the efficiency and effectiveness of the System. Appendix B addresses the allegations and the results of our review in more detail. DoD developed the Internet-based system to provide the capability to efficiently schedule, manage, document, and report military airspace use data. The System is to interface with selected existing Special Use Airspace scheduling systems and, where feasible, provide a consolidated database of schedule data and scheduling capability for nonautomated users. In addition, the System will interface with the Federal Aviation Administration for airspace use reporting.

Results. After 10 years of development and fielding, and expenditures of \$24 million, the System has not met its original objective of being a DoD-wide system for managing military airspace scheduling functions and providing usage information to DoD and the Federal Aviation Administration. The Services and scheduling agencies were not using the System, the System was being asked to do too many functions for too many different types of airspace, it was too cumbersome for easy use, and System airspace usage reports did not fulfill the reporting requirements of other agencies. Training was also inadequate because of limited funding and resources, a lack of coordination from the user community, and discord between the evolving System and current training materials. In addition, the funds that the Air Force spent on the Military Airspace

Management System were not effective because the System had not met many Service requirements. Survey responses from 193 of 621 users of the system showed that:¹

- 34 percent (66 of the 193) said it had the required functionality,
- 37 percent (71 of the 193) said it was user friendly, and
- 38 percent (73 of the 193) would recommend the System.

Management Comments and Audit Response. The Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) concurred with the recommendations, but did not provide an action plan and completion dates for implementing two of the recommendations. The Air Force provided unsolicited comments. The Air Force agreed with the recommendations, but commented that it would be hesitant to agree with allowing the other Services to interface directly with the Federal Aviation Administration, due to safety concerns. Additionally, the Air Force commented that minor upgrades and technical refreshment efforts would be required to ensure that the System remains operational. We agree that safety concerns should be considered when deciding whether the other Services should interface directly with the Federal Aviation Administration in scheduling airspace. Also, we recognize that the Air Force may need to make minor expenditures to keep the Military Airspace Management System operational until the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) and the Air Force determine the most cost-effective alternative for scheduling military airspace. We request that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) provide, by July 25, 2002, an action plan with dates of completion for establishing an in-process action team to determine whether the System is the most cost-effective scheduling tool to meet future DoD scheduling needs and for tasking the Services to standardize scheduling procedures. A discussion of the management comments is in the Finding section of the report and the complete text is in the Management Comments section.

¹ Note: Percentages reflect actual responses to each question and may not represent the 193 surveys returned or the 621 account holders surveyed.

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Background

Allegations. The Inspector General of the Department of Defense received seven Defense Hotline allegations concerning the Military Departments' development and use of the Military Airspace Management System (MAMS). Appendix B addresses those allegations and the results of our review.

System Description. The MAMS is an Internet- and software-based system intended to provide the Services with a capability to efficiently schedule Special Use Airspace (SUA) DoD-wide and to accurately document and report Service use of SUA to the Federal Aviation Administration (FAA). MAMS includes a centralized data automation bank based on a distributed wide area computer network that is intended to interconnect with other DoD scheduling systems and appropriate FAA facilities. The system is to serve as a management and scheduling system to effectively use military SUA, to document and report the use of that airspace to FAA, and to release unused SUA for joint use.

At the time of the Joint Operational Requirements Document, September 20, 1993, DoD was unable to provide near real-time scheduling and management of airspace or near real-time airspace usage data collection and reporting because of data processing constraints. DoD intended MAMS to work with the FAA Special Use Airspace Management System (SAMS), a subsystem of the Military Operations Systems. The mission of the SAMS is to provide the most efficient use of airspace while providing effective coordination between DoD and FAA to ensure the maximum level of safety for the users.

Diversity of Special Use Airspace. Within the continental United States, there are two categories of Military Airspace. The first category is SUA that includes warning areas, military operations, and restricted areas. It also includes areas where flight is prohibited at any time, such as the White House and various monuments. The second category is Other Airspace that includes military training routes, air traffic control-assigned airspace, aerial refueling anchors, aerial refueling tracks, and altitude reservations.

MAMS Development. The Joint Program Office developed MAMS for DoD in response to two General Accounting Office (GAO) reports that documented the need for comprehensive long-range airspace planning and the need for DoD and other agencies to submit standardized usage reports to the FAA to support their use of SUA. Specifically:

- Report No. NSIAD-87-93, "Better Planning Is Needed to Meet Future Requirements," March 23, 1987, documents that DoD needed comprehensive long-range airspace planning to help ensure that the Services meet future airspace requirements. The report recommends that the Services develop comprehensive airspace plans that defined, validated, and supported their future airspace requirements.
- Report No. RCED-88-147, "FAA Needs to Improve Its Management of Special Use Airspace," August 5, 1988, reviews FAA

management of SUA, which is primarily used for military training. The GAO found that the FAA was not effectively managing SUA to ensure efficient and appropriate use. The report recommends that the Secretary of Transportation direct the FAA to require standardized user reporting of actual usage data for restricted areas, periodic review of the usage reports, and establishment of standards for measuring the effectiveness of SUA utilization.

On June 11, 1987, the Department of the Air Force validated a Statement of Operational Need for MAMS. The Air Force then tasked MITRE to develop an airspace management prototype. In October 1989, MITRE developed the prototype under letter contract F19628-89-C-0001 at a cost of \$750,000. The MITRE prototype used a Unix operating system specifically for scheduling SUA at Edwards Air Force Base, California. On March 16, 1993, the Air Force successfully conducted a MAMS prototype demonstration at Edwards Air Force Base. A Designated Acquisition Commander memorandum, April 24, 1994, gave approval for MAMS to enter into Phase II, Engineering and Manufacturing Development phase of the acquisition process.

On February 24, 1992, the Air Force Electronic Systems Center advertised the MAMS notice of contract action (solicitation) in the *Business Commerce Daily*. The Air Force Electronic Systems Center modified the solicitation six times before awarding the contract because of changes to the acquisition strategy, contract type, and hardware. The solicitation process took about 27 months.

On June 8, 1994, the Air Force Electronic Systems Center awarded an engineering and manufacturing development contract to Computer Based Systems, Incorporated, in Fairfax, Virginia. Computer Based Systems Incorporated experienced systems development problems and the Air Force Electronic Systems Center terminated the contract for convenience on December 19, 1996, at a cost of \$1,220,980. Prior to terminating the contract with Computer Based Systems Incorporated, the Air Force Electronic Systems Center awarded a sole-source contract to Hughes as delivery order contract F04606-95-D-0070-0016, effective November 3, 1995, in the amount of \$11.4 million. In 1997, Raytheon acquired Hughes and continued to use the same facility and employees in Lanham, Maryland, for the MAMS project. However, Raytheon proposed an alternative approach to develop MAMS using an Internet-based, windows platform program, which the program office accepted. The MAMS became operational at Tinker Air Force Base, Oklahoma, in October 2000.

MAMS Sustainment. Air Force performs the MAMS sustainment effort for DoD. The sustainment project management office and the MAMS Central Facility are located and managed at Tinker Air Force Base, Oklahoma. MAMS was an Acquisition Category III program. On September 14, 2000, Air Force Electronic Systems Center awarded Computer Hi-tech Management, Inc., and Raytheon Information Technology and Scientific Services sustainment contracts through the General Services Administration. Computer Hi-tech Management, Inc., provides database administration, helpdesk support services, and training,

while the Raytheon Information Technology and the Scientific Services provides development, implementation, and maintenance support for the MAMS system.

Survey Questionnaires. To help accomplish our audit objective, we developed and distributed survey questionnaires to the Service MAMS users. The MAMS survey was designed primarily to obtain “yes” or “no” responses and to provide users with the opportunity to submit written feedback regarding MAMS. The results of the survey also helped determine the validity of the Defense Hotline allegations.

Although the MAMS Concept of Operations states that approximately 250 DoD units have authority to schedule SUA, the program office states the actual number of units is 255. We received a list of 1,023 account holders from the project management office, which included 621 active individual account holders and 402 inactive individual account holders (prior accounts). Of the 621 active account holders, 193 Service account holders returned their survey questionnaire. The responding Service account holders are the airspace requesters, airspace schedulers, and airspace managers. Airspace requesters are users of airspace who need SUA in order to conduct their missions, airspace schedulers who manage airspace under their cognizance and report its usage, and airspace managers who analyze airspace use and work to achieve overall system efficiency.

Of the 193 surveys returned, we did not receive responses to each of the 11 questions on all of the survey questionnaires, as they were not always required and, in some cases, were not provided. The Air Force accounted for 165 of the 193 total surveys and is the Service that predominantly uses MAMS. For the most part, the Navy and the Army were not using MAMS because of their unique requirements. The remaining user surveys include 13 for the Navy, 8 for the Army, and 7 for the Marine Corps (see Appendixes C and D, respectively, for the specific survey questions and for a further breakdown of user response by Service and user function).

Objectives

The overall audit objective was to review and assess allegations concerning the efficiency and effectiveness of the Military Airspace Management System. Specifically, we reviewed the training requirements for the system, as well as capabilities, limitations and use of the system. See Appendix A for a discussion of the audit scope and methodology.

Military Airspace Management System Usage

The Military Airspace Management System (MAMS), developed by the Joint Program Office to satisfy DoD-wide requirements to manage, schedule, and document the use of SUA, had not gained widespread use and acceptance throughout DoD. The following factors contributed to the System's lack of use and acceptance:

- MAMS did not meet many of the Service-unique schedule requirements for SUA;
- the Services lacked policies and procedures to standardize their SUA schedule process;
- each Service believed its own airspace scheduling system was efficient and effective and questioned the usefulness of MAMS;
- the requirement for other DoD scheduling systems to interface with MAMS had not been met, and the majority of the FAA centers were not using the FAA SAMS, which was designed to interface with MAMS;
- the MAMS program lacked a DoD functional sponsor and adequate funds for improvements; and
- MAMS did not meet all testing requirements.

As a result, after 10 years of development and fielding, and expenditures of more than \$24 million, the MAMS had not met its original objective to become the DoD-wide system for managing military airspace scheduling functions and for providing usage information to DoD and FAA.

Guidance on National Airspace

The initial DoD Directive 5030.19, "DoD Responsibilities on Federal Aviation and National Airspace System Matters," June 22, 1989, directed the Military Services to develop, deploy, and sustain MAMS to ensure availability of airspace and the timely release of airspace when not needed. The revised DoD Directive 5030.19, "DoD Responsibilities on Federal Aviation and National Airspace System Matters," June 15, 1997, designates the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) to provide policy and oversight of DoD interface with FAA on all National Airspace System matters. The revised DoD Directive 5030.19 also establishes the DoD Policy Board on Federal Aviation and designates Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) as the Chair of the

Policy Board. In addition, the revised Directive requires operational interoperability of equipment between DoD and FAA.

MAMS Use and Acceptance

Since the Air Force fielded the first MAMS in October 2000, it had not gained widespread use and acceptance throughout DoD. Based on the survey results, the Army, Navy, and Marine Corps had limited or no usage of the system. An E-mail dated October 19, 2000, from the Navy's Head, Airspace and Air Traffic Control Programs, directed its airspace requesters, schedulers, and managers not to use MAMS until all their personnel were trained on the system. In addition, as of February 2002, despite Air Force direction to use MAMS, only 48 of 111, or 43 percent, of Air Force survey respondents at SUA units were using MAMS.²

Factors Effecting Use and Acceptance of MAMS

The following factors contributed to the lack of widespread Service use and acceptance of MAMS: the System did not meet many of the Service-unique requirements for SUA; the Services lacked policies and procedures to standardize their SUA schedule process and believed that their existing schedule systems for SUA were efficient and effective; Service users questioned the usefulness of MAMS because the requirements for the other DoD scheduling systems to interface with MAMS had not been met; the majority of FAA Centers were not using FAA SAMS, which was designed to interface with MAMS; the MAMS program lacked a DoD functional sponsor and adequate funds; and MAMS had not met all testing requirements.

Service-Unique Schedule Requirements. The requirements for airspace scheduling differ for each Service, as well as within each Service. Services schedule different types of airspace for different reasons. Airspace can have many unique types of operations that are conducted simultaneously. Examples of Service-unique airspace schedule requirements follow.

Army and Marine Corps Scheduling. The Army uses SUA for firing field artillery, mortars, remotely piloted vehicle operations, aircraft ordnance delivery and test flights, laser activities, and various types of research and development. Although the Marine Corps falls under the Navy, its missions are very similar to that of the Army. The Army and Marine Corps schedule SUA using the Range Facility Management Support System.

Navy Scheduling. The Navy uses the Fleet Area Control and Surveillance Scheduling System (FACSKED) for scheduling because MAMS does not have the capability to schedule subsurface missions. The Navy

²There were 165 total Air Force respondents and only 111 addressed this question regarding MAMS use. The 111 may not represent the 193 who returned their surveys or the Air Force account holders who were surveyed.

requires the capability to schedule surface missions (starts on the ocean surface and goes down to minus 98 feet) and subsurface missions (starts at minus 98 feet and goes down to the ocean floor), where the Navy schedules ocean space like airspace. Airspace starts at 1 foot above the surface and goes up into the atmosphere.

Air Force Scheduling. The Air Force uses several types of SUA in support of preliminary, primary, and advanced flight training; training for missions, such as counter air, strategic attack, and surveillance; and research, development, and testing of new equipment. Some Air Force units use many types of SUA and fly a significant number of missions daily. Because of the different missions and their reporting requirements, Air Force units consider MAMS inefficient and ineffective for their use.

Service Policies for Standardizing Scheduling Process. With the exception of the Air Force, the other Services lacked policies and procedures for standardizing their SUA schedule process. Although the Air Force was directed to use MAMS, the airspace scheduling units continued to use the existing systems. A standardized SUA scheduling system within each Service would contribute significantly to meeting the requirements of the "Joint Operational Requirements Document," September 20, 1993, which requires other automated scheduling systems to interface with MAMS to report usage data. A Service standard scheduling system can be tailored to meet a unit's unique requirements. Standardization would enhance efficiency and effectiveness by requiring only one interface with MAMS. Also, standardized Service scheduling systems would ensure continuity as resources rotate from one unit to another. At the time of the review, the Services used a variety of mechanisms to schedule SUA, such as the legacy systems noted in Appendix E, Access databases, Excel spreadsheets, and manual entries that made it difficult to interface with MAMS.

Efficiency and Effectiveness of Existing Service Scheduling Systems Versus MAMS. To determine the efficiency and effectiveness of existing Service Airspace Scheduling Systems and the usefulness of MAMS, we interviewed airspace schedulers and collected Service documentation and guidance on the use of existing scheduling systems and MAMS. Additionally, we distributed survey questionnaires relating to user satisfaction to MAMS users.

User Interviews and Service Documentation. According to the Services, existing scheduling systems were more efficient and effective than MAMS. Service users indicated that in MAMS, it takes 12-15 minutes to log on the Internet site and that after logging on, they must complete 13 steps to request a mission. Once the request is entered, a response on the scheduling end must be sent to accept or deny the mission. If the scheduling unit is not using MAMS, or does not use it on a full-time basis, the request may not be approved in an acceptable amount of time. Conversely, in some current scheduling systems, it is just a matter of the requester calling the scheduler and the scheduler entering the data into an Excel spreadsheet to decide whether to accept or deny the mission, a matter of two to three steps. Appendix E provides additional detail on the various scheduling systems that the Services were using. The Service users also stated that MAMS does not fulfill their reporting

requirements, such as range use reporting. The range usage report tracks a variety of data associated with determining range workload requirements and providing information associated with environmental actions, such as maintaining records of all hazardous material (ammunition and explosives) used during training and operational missions. Range usage data is needed for residue clearance and decontamination of ranges. Additionally, Air Force users stated that they do not use MAMS because customers are not using the system to schedule missions. Further, Air Force units stated that MAMS is redundant and complex, and that the inflexibility of MAMS makes it manpower intensive and frustrating to use. In addition, the Air Force users expressed concerns about the inability of MAMS to accommodate short notice changes, down time, the System's slow connection and response time, conflict identification, and FAA scheduling and usage reporting.

Short Notice Changes and Down Time. Account holders said that the System is unable to easily accommodate short notice changes and down time. Both short notice changes and down time require manual notification and deconfliction (resolving conflicts that arise during mission scheduling) for mission accomplishment, which result in increased workload (labor intensive) and decreased safety and efficiency. Weather changes and maintenance requirements are examples of short notice changes and down time.

Connection and Response Time. Required connection and response time are essential for MAMS to achieve its mission; however, the users reported difficulty in logging on to the system, maintaining a connection, and working at a reasonable speed. In addition to the survey responses to each of the 11 questions, we received additional comments from users and 28 stated that MAMS is too slow. Major comments included that the system is labor intensive, very slow even on powerful computers, and that the system is cumbersome and too complicated for everyday use without extensive training. However, the MAMS Response-Time Study, which MITRE performed in April 1999, indicated that the MAMS server, the MAMS link to the Internet, and the MAMS firewall are not the cause of any meaningful response time delays. The study concluded that the user's site must be the source of the performance problem for those users who experience consistently long response time delays. The cause of actual or perceived long response time may be that the users' workstations are incorrectly configured.

Conflict Identification. The MAMS conflict identification tool operates properly and identifies various categories of conflicts; however, the system allows the scheduler to "override" the safety of flight conflict and approve the mission. Some of the conflict categories are safety of flight points where instrument routes cross each other; for example, one aircraft overtaking another on the same route. Another example is the time that schedulers take to resolve conflicts for airspace that is subdivided. Subdivisions are designed to activate together to create different altitudes (higher to lower), which are used in training exercises. When a unit schedules a subdivision for training, the unit activates one airspace, but the MAMS recognizes the subdivision as five

different independent airspaces. A subdivision schedule conflict shows up five times in MAMS, requiring the scheduler to resolve each conflict separately creating additional time and work for the scheduler.

FAA Scheduling and Usage Reporting. MAMS should generate airspace schedules and transmit required usage reports to FAA; however, the users were not scheduling through MAMS. One reason given by the MAMS users was that many FAA centers are not using SAMS, which is needed for FAA to interface with MAMS. Another reason was that MAMS expects to receive usage data from the scheduler. MAMS counts all scheduled events as used unless users reopen the program and check each specific event as “not used.” An example of problems relating to reporting use of airspace is when scheduling agencies use military operating areas and military training routes. The scheduling agency has no knowledge whether the airspace was actually used, which results in inaccurate usage reporting if someone does not report in MAMS whether each scheduled event occurred.

Guidance on the Use of MAMS. Guidance from the Air Force Director of Operations and Training, Deputy Chief of Staff, Air and Space Operations and the Director, Aerospace Operations for the Air Combat Command further illustrated Service frustration with MAMS. The Director issued interim e-mail guidance, “Interim Military Airspace Management System (MAMS) Guidance,” to the Air Force on February 6, 2001. The message states that the MAMS problems are more than simply “growing pains” and addresses issues with the alert system and system access. The Director’s guidance further states that, while the developers are correcting the problems, it is imperative that the Air Force continue to maintain positive control over the scheduling of military airspace. The Director tasked the units to comply with the following guidance:

- until MAMS reliability improves, units will continue to manually schedule and deconflict missions;
- once manually scheduled and deconflicted, the data will be entered into MAMS to exercise the system and capture airspace usage data; and
- where airspace overlaps, ensure that Letters of Agreement provide guidelines for deconfliction and schedule procedures to ensure flight safety. Units scheduling airspace managed by other Services will continue per established procedures or Letters of Agreement.

Additionally, the Director, Aerospace Operations in a memorandum dated September 18, 2000, to Air Combat Command Wing Commanders, states that the Air Force Associate Directorate for Ranges and Airspace directed that all Air Combat Command units integrate MAMS into their scheduling process. The unit implementation of MAMS was to commence on October 1, 2000. Despite the direction from the Air Force Associate Directorate for Ranges and Airspace, many units displayed a lack of interest in participating in the development phase and have opted not to use MAMS. One reason was that there was not a knowledgeable airspace manager directly tied to the program. It

is imperative that experienced airspace managers be made an integral part of the development and testing phases. As a result, MAMS is not the single electronic interface for providing SUA schedules and historical activation and usage data as envisioned in the Concept of Operations, which discusses the two categories of interfaces, the other DoD scheduling systems, and the FAA SAMS.

User Feedback on Survey Questionnaire. Like the user interviews and Service documentation, responses to the survey questionnaire showed that account holders (users) question the use of MAMS and are not satisfied with the system. Specifically, the survey showed that while MAMS was highly accessible, the user community remained fundamentally dissatisfied with the system. Table 1 and Table 2 indicate the percentage of “yes” responses regarding MAMS accessibility, use, and satisfaction.

Table 1. Percentage of Respondents Answering “Yes” to Questions Regarding MAMS Accessibility

<u>Question</u>	<u>Percentage</u>
Has heard of MAMS (191 of 193)	99
Has internet access (192 of 193)	99
Has MAMS account (177 of 193)	92

Note: The 193 respondents may not be representative of the 621 current account holders.

Table 2. Percentage of Respondents Answering “Yes” to Questions Regarding MAMS Use and Satisfaction

<u>Question</u>	<u>Percentage</u>
Uses MAMS (50 of 185)	27
MAMS has required functionality (54 of 159)	34
MAMS is user friendly (58 of 158)	37
Recommends MAMS (61 of 165)	37

Note: Percentages reflect actual responses to each question and may not represent the 193 surveys returned or the 621 account holders surveyed.

Table 2 shows that only 50 of 185, or 27 percent, of user responses indicated that they use MAMS to schedule SUA. The reasons that account holders reported low usage include: not all units are scheduling through MAMS; MAMS does not meet needs to schedule surface and subsurface vessels; there is not a mandate to use the system; and it is too slow, difficult to use, and lacks effectiveness. In addition, only 54 of 159, or 34 percent, of respondents believed that MAMS had the necessary functionality. Some of the explanations respondents provided include that MAMS is too time-consuming, lacks real-time scheduling capability, and does not properly address Service-unique requirements. User feedback concerning a low level of user friendliness and desire to recommend MAMS frequently noted that the system is too complicated for everyday use without extensive training, the system requires too much data input, and that too many screens and unnecessary actions are required.

In addition, survey respondents were asked to indicate which scheduling systems other than MAMS they were using. Of the 128 respondents, 72 account holders stated that they schedule manually; 17 used legacy systems that included the Range Facility Management Support System, the Resource Scheduling and Operations Management System, the Military Airspace Management System (MASMS), which was the predecessor system to MAMS that had the same name but different acronym; and the Fleet Area Control and Surveillance Scheduling System. Another 39 account holders met their scheduling needs through other methods, including locally produced Excel spreadsheets, facsimile, e-mail, and telephone.

Interfacing with Other DoD Scheduling Systems and FAA. Two categories of external interfaces include other DoD scheduling systems and the FAA SAMS. MAMS is to provide a single generalized interface for all other DoD scheduling systems and the FAA SAMS. Other DoD scheduling systems have not yet interfaced with MAMS. Currently, MAMS interfaces with FAA; however, FAA received less than 1 percent of its scheduled messages from MAMS from August 8, 2001, through January 30, 2002.

MAMS Interface with Other DoD Scheduling Systems. On January 29, 1999, the Services and the Executive Director for the Policy Board on Federal Aviation signed an interface agreement that provided the baseline description for the exchange of information between the DoD MAMS and other DoD scheduling systems concerning SUA. However, the agreement was neither intended nor designed to change operational policies, existing Letters of Agreement and Letters of Procedures, and other local agreements defining the day-to-day operation of the National Airspace System, nor did it require that the Services replace the existing systems for scheduling SUA with MAMS. The interface agreement states that the Services have the option to use MAMS, continue with the existing system and develop an interface with MAMS, or use a combination of their system supplemented by direct use of MAMS.

The requirement for MAMS to interface with other DoD scheduling systems was still not operational because no interface existed from other DoD scheduling systems to MAMS. The Joint Program Office developed MAMS to be a system that initially interfaced with other DoD SUA scheduling systems, and it was intended to provide a consolidated database of scheduling, a scheduling capability for nonautomated users, and an electronic interface to FAA for the transmission of electronic schedule and usage data.

MAMS Interface with FAA. On March 2, 1998, the Executive Director of the Policy Board on Federal Aviation and the FAA Program Director for Air Traffic Operations signed “The MAMS/SAMS Interface Agreement between the DoD and FAA.” The intent of the interface agreement was for the DoD airspace-scheduling agencies to transmit electronically an airspace schedule message from the MAMS Central Facility directly to the FAA SAMS. However, the majority of FAA centers were not using SAMS, which was designed to interface with MAMS.

FAA Centers. The FAA had 26 air control centers (23 Air Route Traffic Control Center and 3 towers). Of the 26 centers, 10 frequently use SAMS, 6 centers were not frequently using SAMS, and 10 sites were unsure of their status with SAMS.

MAMS and SAMS Usage. The FAA manually scheduled about 500 to 800 schedules per day. Data received from an FAA representative disclosed that from August 8, 2001, through January 30, 2002, SAMS received 540 messages from MAMS. Comparing the volume of MAMS scheduled messages to SAMS during the same period to manually scheduled entries into SAMS per month showed that MAMS messages were less than 1 percent of the total volume.

MAMS Information Exchange with FAA SAMS. As defined in the DoD FAA Interagency Agreement on the MAMS/SAMS interface, dated March 2, 1998, MAMS will provide schedule and usage data to SAMS. SAMS schedule data include the unit site, airspace name, date, start time, low entry point, exit time, and high exit point. Prior to the full deployment of the FAA SAMS, schedule information will be forwarded in accordance with existing procedures. Once MAMS is deployed, the users will provide electronic schedules to FAA. The interface control document between the DoD MAMS and the FAA SAMS, signed April 16, 1999, provides detailed protocols and formats for the exchange of information.

DoD Sponsorship and Funding. The MAMS program lacked a DoD functional sponsor and adequate funding to address known system problems, despite the effort and motivation of the MAMS Central Facility to improve MAMS acceptance.

DoD Sponsorship. MAMS lacked a DoD functional sponsor and did not have any near-term, future programmed funding for major improvements because MAMS is an Air Force-managed program that did not have authority to program funding. MAMS was also an Acquisition Category III program;

therefore, funding support was a lower priority within the Air Force and other Services. Further, the Air Force Flight Standards Agency must fund system modifications, and any proposed MAMS modification must compete for funding with other Air Traffic Control and Landing Systems for 3080 (Other Procurement) money.

System Funding. The Air Force cost for developing MAMS from March 1990 through September 2000 was \$24.4 million. The Army, Navy, and Air Force provided funding of \$2 million per year for operating and maintaining MAMS since it was fielded in October 2000. The sustainment funding was prorated as follows: the Navy and Air Force each contributed \$800,000 (40 percent) and the Army contributed \$400,000 (20 percent). The Air Force also projected an annual sustainment budget of \$2 million in future years. The MAMS project management initially considered a major technical refreshment for MAMS from FY 2005 through FY 2007, with total estimated costs of \$13 million, but later withdrew its consideration. The technical refreshment considered by the project management office would have included revisions to the Digital Aeronautical Flight Information File and procurement of additional computer and server technology for the MAMS Central Facility. The Air Force cannot sustain any future technical refreshment with the current yearly commitment of \$2 million in sustainment funding.

Testing Requirements. Although the Air Force fielded MAMS in October 2000, it had not tested all required elements of the Requirements Underlying Baseline for MAMS, including the MAMS load balancing test, the Sybase Replication Server test, and other DoD scheduling system tests. Those tests were needed to ensure MAMS availability, reliability, and maintainability within the user community. Other significant testing limitations included a waiver for Operational Test and Evaluation for MAMS and limitations to subsequent test and evaluation and acceptance tests.

Waiver for Operational Test and Evaluation. On November 17, 1997, the Air Force Operational Test and Evaluation Center issued a memorandum, "Operational Test and Evaluation Determination for Military Airspace Management System (MAMS)," stating that an analysis of the test strategy for the MAMS was completed from October 1 through October 2, 1997. The Air Force Test and Evaluation Center waived the operational test and evaluation for MAMS because the results of the analysis determined that the initial development for a stand-alone hardware system using newly developed software compatible with various DoD systems had changed to an Internet-based software system, resulting in low-risk development.

Combined Test and Evaluation. The Combined Test and Evaluation for MAMS was conducted in FY 1998 and the Delta (Spiral) Combined Test and Evaluation was conducted in FY 1999. The purpose of the tests was to identify the extent that MAMS was able to meet testing objectives. Similar limitations existed in both tests, such as two limitations that related to the external systems not fully implementing required interfaces at test time, and one

limitation regarding MAMS program implementation delay, which delayed the Defense Information Infrastructure Common Operating Environment compliance testing.

MAMS Acceptance Tests. The Electronic System Center, Hanscom Air Force Base, Massachusetts tasked the 46th Test Squadron, Eglin Air Force Base, Florida, to conduct a technical evaluation of the MAMS. The technical evaluation included the results of the acceptance test on the system as configured for the MAMS Central Facility. The system was tested by the contractor, Raytheon, using procedures approved by the Electronic Systems Center MAMS program office. Government and contractor acceptance tests had significant limitations.

Government Acceptance Testing. The Air Force Electronic Systems Center, Hanscom Air Force Base, Massachusetts, tasked the 46th Test Squadron, the responsible test organization, to conduct acceptance testing on the MAMS version 2.1. The testing was conducted from February 29 through March 22, 2000. The purpose of the acceptance testing was to verify the Requirements Underlying Baseline, which was created to expand on the requirements in the MAMS Joint Operational Requirements Document. The 46th Test Squadron did not test the MAMS capability to distribute reports, verify software maintainability, verify hardware maintainability, verify meantime between critical failure of individual work stations requirements, and demonstrate fault detection capability.

Contractor Acceptance Testing. Raytheon conducted functional tests on MAMS versions 2.2.2 performance tests from December 4 through December 6, 2001. Testing continued at the Defense Information Systems Agency from December 11 through December 14, 2001. Test results from "MAMS Central Facility Support Test Report for the Military Airspace Management System (MAMS)," version 2.2.2, February 2002, show that the contractor did not conduct the following planned tests:

- The MAMS Load Balancing test -- ensures no interruption of service if the primary server fails;
- The Sybase Replication Server test -- ensures that the backup database server has no interruption of service if the primary database fails;
- The Digital Aeronautical Flight Information File test -- an action taken by a user to update the Flight Information Publication database with new Digital Aeronautical Flight Information File data;
- The Save and Restore Baseline test -- used to save the MAMS database and load/restore it on a server; and
- The Other DoD Scheduling System test -- interface test was not performed because the operational interface was not available.

System Vulnerability Test. In May 2000, the Air Force Information Warfare Center performed a vulnerability assessment test on MAMS. The results of the vulnerability assessment found numerous system vulnerabilities to include access concerns that involved user identification and password. For example, the Air Force Information Warfare Center established that several user accounts did not fully comply with the Air Force password policy. Specifically, access was permitted when user names and passwords were the same, and passwords could be easily cracked because of noncompliance with a recommended mix of upper and lowercase letters, numerals, and special characters. As of April 2002, the MAMS Central Facility had not corrected all of the system vulnerabilities that were outlined in the Air Force Information Warfare Center assessment.

Conclusion

After 10 years of development and fielding, and expenditures of \$24 million, the MAMS had not met its original objective to become the DoD-wide system for managing military airspace scheduling functions and providing usage information to DoD and FAA. Based on discussions with users, Service documentation, and user survey results, the Assistant Secretary Defense (Command, Control, Communications, and Intelligence) needs to reevaluate the MAMS program and the Service SUA requirements to determine whether the MAMS is the most cost-effective system to meet future DoD requirements for scheduling SUA and usage reporting. The MAMS program has not gained widespread acceptance and use among the Services, despite the MAMS Central Facility dedication and progress in correcting problems.

Air Force Comments on the Report and Audit Response

The Deputy Chief of Staff for Air and Space Operations, Department of the Air Force provided unsolicited comments on the allegations. Audit results are discussed in Appendix B. A summary of Air Force comments and the audit response is in Appendix F.

Recommendations, Management Comments, and Audit Response

A. We recommend that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) task the Air Force, as the executive agent for the Military Airspace Management System, to:

1. Establish a Military Airspace Management System in-process action team, which includes representation at the user level from all Services, to conduct an analysis of the Military Airspace Management

System and determine whether it is the most cost-effective scheduling program to meet DoD future airspace scheduling, usage, and reporting requirements. The in-process action team should:

- a. Identify each Service's future requirements for Special Use Airspace scheduling, usage, and reporting;**
- b. Evaluate any new technology available for scheduling and reporting usage data of Special Use Airspace to the Federal Aviation Administration; and**
- c. Consider whether it would be more cost-effective if each of the Services uses its current scheduling system and develops an interface directly with the Federal Aviation Administration.**

Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) Comments. The Director, Communication Programs, responding for the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), concurred.

Department of the Air Force Comments. Although not required to comment, the Deputy Chief of Staff for Air and Space Operations, Department of the Air Force (the Deputy Chief of Staff) stated that the Air Force agreed with the recommendations but would be hesitant to agree with allowing the other Services to interface directly with the Federal Aviation Administration, due to safety concerns. The Deputy Chief of Staff provided an estimated completion date of July 2003 for the MAMS in-process action team evaluation.

Audit Response. In response to the final report, we request that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) provide an action plan and completion dates for implementing the recommendation. We agree that safety concerns should be considered in deciding whether the other Services should interface directly with the Federal Aviation Administration in scheduling air space.

2. Suspend any future installation of upgrades or technical refreshment efforts for the Military Airspace Management System until completing the cost-effectiveness analysis.

Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) Comments. The Director, Communication Programs, responding for the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), concurred, stating that his office will fund only the MAMS operations and maintenance costs until completion of the cost-effectiveness analysis.

Department of the Air Force Comments. Although not required to comment, the Deputy Chief of Staff agreed with the recommendation but suggested that minor upgrades and technical refreshment efforts were required to ensure that the MAMS remains operational.

Audit Response. The comments from the Director, Communication Programs were responsive. We recognize that the Air Force may need to make minor expenditures to keep the MAMS operational until the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) and the Services determine the most cost-effective alternative for scheduling airspace.

B. We recommend that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) task the Army Deputy Chief of Staff for Operations and Plans; the Head, Airspace and Air Traffic Control, Department of the Navy; and Director of Operations and Training, Deputy Chief of Staff for Air and Space Operations, Headquarters U.S. Air Force to develop and implement policies and procedures to standardize the Special Use Airspace scheduling process.

Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) Comments. The Director, Communication Programs, responding for the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence), concurred.

Department of the Air Force Comments. Although not required to comment, the Deputy Chief of Staff agreed with the recommendation stating that the Air Force is already in compliance.

Audit Response. In response to the final report, we request that the Assistant Secretary of Defense (Command, Control, Communication, and Intelligence) provide an action plan and completion dates for implementing the recommendation. Although the Air Force does have policies and procedures requiring a standardized Special Use Airspace scheduling process, a standardized process has not been fully implemented throughout the Air Force.

Appendix A. Scope and Methodology

Scope

Work Performed. We reviewed documentation dating from March 1987 through April 2002 including background information, mission and operational need statements, training and operational requirements, and contracting and budget documents. Also, we conducted interviews with officials at Tinker Air Force Base, Oklahoma; Hanscom Air Force Base, Massachusetts; FAA headquarters, and the Defense Enterprise Computing Center to gain information on MAMS operations. Further, we reviewed 193 responses on survey questionnaires from MAMS users in all Services to assess user satisfaction with the MAMS program. Finally, we attended the November 15, 2001, Configuration Control Board meeting at Fort Belvoir, Virginia, and visited several sites within the Services that were scheduling Special Use Airspace.

Limitation to Scope. Because our objective was limited to evaluating a Defense Hotline allegation related to the efficiency and effectiveness of the Military Airspace Management System, its capabilities, limitations, and training requirements, we did not review the management control program.

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the DoD System Modernization high-risk area.

Methodology

To assess allegations concerning the efficiency and effectiveness of the MAMS, we developed a survey questionnaire, which we sent to 621 active account holders within the Departments of the Army, Navy, and Air Force. To maximize survey participation and to encourage candid responses, we promised respondents to each survey questionnaire that we would keep their individual responses confidential.

Use of Computer-Processed Data. We did not rely on computer-processed data or statistical procedures.

Use of Technical Assistance. Personnel from the Audit Follow-up and Technical Support Directorate assisted us during the audit. The Quantitative Methods Division assisted in the development and analysis of survey results. The Technical Assessment Division assisted in reviewing test plans and results.

Audit Type, Dates, and Standards. We conducted this economy and efficiency audit from September 2001 through April 2002 in accordance with generally accepted government auditing standards.

Contacts During the Audit. We visited or contacted individuals and organizations within DoD, selected DoD contractors, and the Department of Transportation. Further details are available upon request.

Prior Coverage

During the past 5 years, there have been no reports issued concerning the Military Airspace Management System.

Appendix B. Allegations and Audit Results

On July 5, 2001, a complainant submitted seven allegations to the DoD Hotline. Those allegations expressed concerns about the efficiency and effectiveness of the Military Airspace Management System (MAMS) in several areas. Of the seven allegations, we substantiated four, partially substantiated two and did not substantiate one.

Allegation 1: Training for the system is insufficient.

Partially Substantiated. We determined that MAMS training was adversely affected because of limited funding and resources, lack of coordination within the user community, and discord between the evolving MAMS system and the available training materials.

The MAMS Central Facility stopped paying for travel expenses associated with the training, and the Navy stated that it had not budgeted for MAMS training costs.

Many users did not have the necessary MAMS equipment when they received training, or familiarity and expertise with the system. If they had the equipment, it was not up and running. As a result, too much time lapsed between training and use.

Training materials changed with each version upgrade, causing additional problems with cost and notification to the users for updated materials. Currently, the MAMS Central Facility has limited resources for training. The \$2 million sustainment fund included training, manuals, and travel for instructors.

Further, user comments on the survey related to training noted that:

- there is not enough time in class to learn a complex program like MAMS (13 account holders);
- the training was not well-organized (9 account holders);
- the training class is time-consuming and difficult to understand (4 account holders).
- because of limited resources, the Services do not have the money available for training (1 account holder); and
- the user manual is rarely referenced or used during the training (1 account holder).

Allegation 2: Services and scheduling agencies are not using the system.

Substantiated. User response to the survey questionnaire substantiated that the Services and scheduling agencies were not using MAMS. Specifically, out of 193 survey responses received, 128 account holders (5 Army, 11 Navy, 105 Air Force, and 7 Marine Corps) stated that they were using something other than MAMS or in addition to MAMS. See Appendix D for details. Additionally, during the audit, an Air Force user stated that although his organization sent members of the staff for training, it made no sense for them to attempt to use a system that no one else was using. Also, users noted that most units had no time or manpower to dedicate to MAMS and that their current scheduling system was working efficiently and effectively. We did not meet with any units that were using the system to its full potential.

Allegation 3: The program is being asked to do too many functions for too many different types of airspaces.

Substantiated. User response to the survey questionnaire substantiated that the system was being asked to do too many functions to satisfy the diversity of airspace and the Service requirements. Of the 159 survey respondents who answered this question, 105, or 66 percent, stated that MAMS did not have the functionality for them to do their job.

Also, survey respondent comments indicated that using MAMS can greatly increase workload because of the way MAMS views airspace. For example, an airspace can be divided into sections that are labeled A, B, C, D, and E and those sections are designed to activate together for training where aircraft approach at different altitudes. The Air Force scheduling system schedules the subdivisions as one entity; however, MAMS calls those subdivisions Dynamic airspace and identifies them as different airspaces. MAMS requires the requester to activate and deactivate the five different airspaces (A through E) independently of one another. Also, a conflict that shows up in MAMS would require users to make five resolutions, rather than one.

In addition, users stated that:

- MAMS does not resolve conflicts with other SUAs and military training routes (22 account holders);
- MAMS causes a duplication of efforts, it is too labor intensive, Internet dependent, and redundant (21 account holders); and
- MAMS does not have the flexibility of short-term scheduling and it is not mandated for use (5 account holders).

Allegation 4: Many of the users do not have access to the proper computer equipment with Internet access (MAMS is an Internet-based system).

Unsubstantiated. We did not substantiate that significant numbers of users lacked access to the proper equipment with Internet access, as only one Army

response expressed concern with equipment and Internet access issues. While we did not evaluate whether users have access to the proper computer equipment, account holder response to the survey questionnaire indicated that almost all users had the Internet access needed to use MAMS. Specifically, 192 of the 193 survey responses stated that they had Internet access.

Allegation 5: The time, money and effort utilized in building and training for the program is a waste.

Partially Substantiated. While not a complete waste, the money that the Air Force spent on the MAMS was not effective because the system still had not met many Service requirements when the Joint Program Office fielded MAMS in October 2000, after 10 years of development. Specifically, of the 159 respondents who answered this question, 105, or 66 percent, stated that MAMS did not have all the functionality needed for airspace management. Since MAMS fielding, the contractor had issued several versions of MAMS under the current contract to enhance the system's functionality. However, the Services, particularly the Army and the Navy, were not fully using the system because it did not meet Service-unique requirements for the diversity of SUA.

Allegation 6: The scheduling process through the system is cumbersome and is time-consuming compared to the procedures already established.

Substantiated. The Services stated that their current scheduling systems work well and are easier to use than MAMS. As discussed in the Finding section, users stated that in MAMS, it takes 12-15 minutes to log on the Internet site and that after logging on, there are 13 steps they must complete to request a mission. Once they have entered the request, users stated that they have to wait for someone on the scheduling end to send a response to accept or deny the mission. If the scheduling unit is not using MAMS, or does not use it on a full-time basis, the request may not be approved in an acceptable amount of time. Conversely, with current scheduling systems, the requester calls the scheduler and the scheduler enters the data into an Excel spreadsheet in order to make the decision whether to accept to deny the mission just two or three steps. Out of 193 survey respondents, 100, or 63 percent, stated that MAMS is not user friendly. Major comments included that the program is labor intensive, very slow even on powerful computers, and the interface is cumbersome and too complicated for everyday use without extensive training. Also, there is too much duplication of effort to do a simple task.

Allegation 7: The utilization reports generated from the MAMS program are not sufficient to use for the reports that we send to other agencies requiring similar but more detailed information.

Substantiated. In addition to the Services' requirement to report usage of SUA, they are required to provide other reports within their organization and to

other agencies, such as reporting to the Environmental Protection Agency on clean up of hazardous materiel used during training or strategic missions. The MAMS did not provide the tracking or the level of detail needed for these reporting requirements. Also, the majority of FAA centers were not using SAMS, which the FAA needs to interface with MAMS; therefore, many of the DoD users felt no need to use MAMS.

Appendix C. MAMS User Survey Questionnaire

Name _____ Requester
____ Army ____ Navy ____ AF ____ MC Scheduler
Unit _____ Airspace Manager
If applicable, ____ Nat'l Guard ____ Reserve Super Requester

MAMS Questionnaire

- 1) Have you heard of the Military Airspace Management System (MAMS)? ____ Yes ____ No
- 2) Do you have access to the Internet? ____ Yes ____ No
- 3) Do you have a MAMS account? ____ Yes ____ No If yes, on average, how often on a monthly basis do you access the system?
- 4) Have you received MAMS training? ____ Yes ____ No If yes, when, where, and how long?
- 5) Do you feel training for the system was adequate? ____ Yes ____ N/A ____ No If no, please explain.
- 6) If you are an Airspace Manager, have you verified the accuracy of your airspace data in MAMS? ____ Yes ____ No If no, please explain why.
- 7) Are you currently using the Military Airspace Management System (MAMS), which is a centralized database, to schedule special use airspace (SUA)? ____ Yes ____ No If no, please explain why.
- 8) Does MAMS have the functionality necessary for you to do your job? ____ Yes ____ No If no, please explain.
- 9) If not using MAMS to schedule special use airspace, are you currently using (please check all that apply):
____ RFMSS ____ RESOMS
____ MASMS ____ FACSKED
____ OTHER ____ Manual scheduling methods?
If you are using OTHER, what type of program are you using?
- 10) Do you find MAMS user friendly? ____ Yes ____ No Explain your answer.
- 11) Do you recommend using MAMS? ____ Yes ____ No If no, why not? Please provide positive and negative comments.

Appendix D. Responses to MAMS User Survey Questionnaire

Questionnaire Responses From Military Services																											
	Q1 Has Heard of MAMS		Q2 Has internet access		Q3 Has MAMS account		Q4 Received MAMS training		Q5 Training was adequate			Q6 If Mgr..You Verify accuracy of airspace data w/MAMS		Q7 Uses MAMS		Q8 Does MAMS have functionality for you to do your job		Q9 Uses something other than MAMS					Q10 MAMS is user friendly		Q11 Recommends MAMS		
	Y	N	Y	N	Y	N	Y	N	Y	N	N/A	Y	N	Y	N	Y	N	RFMSS	RESOMS	MASMS	FACSKED	Manually	Other	Y	N	Y	N
Requester																											
Army	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Navy	1	1	2	0	2	0	2	0	0	1	1	0	0	0	1	0	1	0	0	0	0	1	0	0	2	1	1
AF	30	0	30	0	30	0	13	17	11	6	13	0	0	13	17	11	16	0	2	0	0	11	5	11	15	8	19
MC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	31	1	32	0	32	0	15	17	11	7	14	0	0	13	18	11	17	0	2	0	0	12	5	11	17	9	20
Scheduler																											
Army	1	0	1	0	1	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	1
Navy	6	0	6	0	4	2	4	2	4	0	2	0	0	1	5	3	2	0	0	0	0	3	1	2	2	1	3
AF	67	1	68	0	62	6	42	26	29	15	24	0	0	23	41	26	34	0	3	1	0	25	12	27	33	23	38
MC	1	0	1	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	0	1
Total	75	1	76	0	68	8	47	29	34	16	26	0	0	24	48	29	38	0	3	1	0	29	14	29	37	24	43
Manager																											
Army	7	0	6	1	5	2	2	5	1	0	6	1	3	0	6	0	2	3	0	0	0	0	1	0	2	2	1
Navy	5	0	5	0	4	1	2	3	2	1	2	2	3	0	5	0	4	0	0	0	2	1	3	0	4	0	5
AF	67	0	67	0	63	4	44	23	23	23	18	40	19	12	53	13	42	2	2	0	0	27	15	16	38	24	34
MC	6	0	6	0	5	1	5	1	3	2	1	1	4	1	5	1	2	2	0	0	0	3	1	2	2	2	1
Total	85	0	84	1	77	8	53	32	29	26	27	44	29	13	69	14	50	7	2	0	2	31	20	18	46	28	41
Aggregate Total	191	2	192	1	177	16	115	78	74	49	67	44	29	50	135	54	105	7	7	1	2	72	39	58	100	61	104

Appendix E. Service's Existing Scheduling Systems

Some scheduling systems in use by the Services include:

FACSKED. The Navy's Fleet Area Control and Surveillance Facilities uses the FACSKED system. The Concept of Operations states that FACSKED will eventually be replaced by MAMS; however, the Navy stated that FACSKED is being replaced by the Navy Scheduling System.

Military Airspace Management System. The Military Airspace Management System (MASMS), which was predecessor to MAMS with the same name but different acronym, was an Air Combat Command-managed system. The Department of the Air Force issued a message on July 20, 1999, instructing all Air Force units to integrate MAMS version 2.0.

Resource Scheduling and Operations Management System. The Resource Scheduling and Operations Management System is the computerized system established at Eglin Air Force Base, Florida, for scheduling missions requiring the use of Air Force Development Test Center ranges or resources. The system is used to submit mission requests, requests for munitions support, and approved profiles (safety, flight, or ground) for specified missions.

Range Facility Management Support System. The Army developed the Range Facility Management Support System and the Army and Marine Corps use the system to schedule air and ground resources and operations. The contractor performed a limited evaluation of the MAMS and Range Facility Management Support System interface. The schedule for Range Facility Management Support System to develop a MAMS interface is from FY 2003 to FY 2004, although full airspace scheduling functionality may not be available by that date under the current funding plan.

Tactical Aircrew Scheduling and Airspace Management System. The Air Force Tactical Aircrew Scheduling and Airspace Management System is a real-time scheduling program that the Air Force Wings use. It is the primary tool used to communicate operational requirements to the various support agencies.

Appendix F. Audit Response to Air Force Comments on the Report

Our detailed responses to the unsolicited comments that the Deputy Chief of Staff for Air and Space Operations, Headquarters, U.S. Air Force (the Deputy Chief of Staff) provided on Appendix B, Allegations and Audit Results, follow. The complete text of the management comments on statements in the draft report is in the Management Comments section of this report.

Allegation 1: Training for the system is insufficient (partially substantiated).

Management Comments. The Deputy Chief of Staff agreed, stating that the MAMS Central Facility at Tinker Air Force Base recognized that MAMS training was not adequate and took steps to correct the deficiency. Specifically, the Deputy Chief of Staff stated that he ensured that students had a valid MAMS account, knowledge of the MAMS user manual, and knowledge of their unit's airspace scheduling procedures before attending training, and that he has modified course content and handouts. Further, the Deputy Chief of Staff stated that Service units will continue to fund training costs for MAMS students until the Joint Program Office can provide funding at no cost to the user.

Audit Response. The Air Force has taken actions that will improve MAMS training.

Allegation 2. Services and scheduling agencies are not using the system (substantiated).

Management Comments. The Deputy Chief of Staff agreed, stating that the Air Force units were not fully using the system because the MAMS tool for detecting scheduling conflicts was malfunctioning. The Deputy Chief of Staff also stated that the Air Force was modifying existing Air Force airspace scheduling systems to use the Other DoD Scheduling Systems interface and that, once interfaces are complete, MAMS will extract usage data. Additionally, the Deputy Chief of Staff stated that a followup report is due September 30, 2002.

Allegation 3. The program is being asked to do too many functions for too many different types of airspace (substantiated).

Management Comments. The Deputy Chief of Staff disagreed, stating that MAMS provides users with the capability to efficiently schedule airspace and accurately document and report usage to the FAA, as well as the capability for identifying conflicts. In addition, the Deputy Chief of Staff stated that the Air Force made numerous improvements to MAMS in response to user requests, and that MAMS provides schedulers with more flexibility in scheduling their airspace and reducing their workload.

Audit Response. While we acknowledge that the Air Force has worked to improve MAMS, the results of our user survey support our conclusion that MAMS still does not have the functionality necessary for them to do their job. Specifically, out of 159 survey respondents, 105, or 66 percent, stated that MAMS did not have the functionality needed for them to do their job. Also, 21 account holders stated that MAMS causes a duplication of efforts, it is too labor intensive, Internet dependent, and redundant.

Allegation 4: Many of the users do not have access to the proper computer equipment with Internet access (unsubstantiated).

Management Comments. The Air Force agreed.

Allegation 5: The time, money, and effort used in building and training for the program is a waste (partially substantiated).

Management Comments. The Deputy Chief of Staff disagreed, stating that the MAMS program is not a waste because it was not intended to be the sole system to schedule SUA, nor was it intended to meet every single user's unique needs. Instead, the Air Force built MAMS to provide an electronic capability to schedule SUA where none existed. In addition, the other DoD scheduling systems' interfaces were designed to give the Services flexibility in meeting their requirements.

Audit Response. We revised our audit conclusion on Allegation 5 in Appendix B to clarify that the money the Air Force spent on MAMS was not a complete waste. Instead, we state that the money the Air Force spent on the MAMS had not been effective in meeting many of the Service scheduling requirements. Additionally, although MAMS may be able to track, compile, and produce annual usage reports to the FAA and it may be the only system that electronically communicates with SAMS, after 10 years of development, the Services were not fully using MAMS. Further, the other DoD scheduling systems interfaces with MAMS were not functional or were nonexistent.

Allegation 6: The scheduling process through the system is cumbersome and is time-consuming compared to procedures already established (substantiated).

Management Comments. The Deputy Chief of Staff disagreed, stating that users must enter data into the system to accurately document activity and produce reports and that comparisons to outdated systems are not valid. He also stated that MAMS has the ability to accept batch entry via spreadsheets, which greatly reduces workload, and that MAMS performance was well within the parameters that the Air Force established in the operational requirements document for the rate of accepting of flight requests. He further stated that poor connection speeds are a function of base infrastructure and are not a reflection of the MAMS.

Audit Response: Our audit conclusion is based on the feedback obtained from 100 of 193 account holders. We acknowledge that poor connection speeds may

be a function of base infrastructure and are not a reflection of the MAMS. As discussed in the Finding section, “Connectivity and Response Time,” the MAMS Response-Time Study that MITRE performed in April 1999 stated that the cause of actual or perceived bad response times may be that the users’ work stations are incorrectly configured. Our report stated that Service users believed that their current scheduling systems (not outdated systems) worked well and were easier to use than MAMS.

Allegation 7: The utilization reports generated from the MAMS program are not sufficient to use for the reports we send to other agencies requiring similar but more detailed information (substantiated).

Management Comments. The Deputy Chief of Staff disagreed, stating that MAMS was designed to meet the reporting requirement of the Federal Acquisition Regulation (FAR)-73 and FAA Order 7400.2, Ch 21, Sect. 7. MAMS also provides computer-based support for efficient management of DoD airspace and for documentation of airspace usage. In addition, MAMS has the capability for units to tailor their reports to meet their requirements.

Audit Response. Our report did not address whether MAMS meets the reporting requirements of the FAR and the FAA order. Although the Air Force response stated that MAMS has the capability to tailor reports to meet a unit’s requirements, the report states that the MAMS does not provide the tracking or the level of detail needed for their reporting requirements.

Appendix G. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense (Comptroller)
Deputy Chief Financial Officer
Deputy Comptroller (Program/Budget)
Deputy Under Secretary of Defense (Acquisition Reform)
Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)

Department of the Army

Assistant Secretary of the Army (Financial Management and Comptroller)
Auditor General, Department of the Army
Chief, National Guard Bureau

Department of the Navy

Naval Inspector General
Auditor General, Department of the Navy
Inspector General, Marine Corps

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force
Chief, Air National Guard Bureau

Non-Defense Federal Organizations

Office of Management and Budget
Department of Transportation
Federal Aviation Administration, Air Traffic Procedures
Military Operations Specialist, Special Operations Division

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations, Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform
House Subcommittee on Technology and Procurement Policy, Committee on Government Reform

Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) Comments



COMMAND, CONTROL,
COMMUNICATIONS, AND
INTELLIGENCE

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000

June 7, 2002

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

FROM: DIRECTOR, COMMUNICATION PROGRAMS

SUBJECT: Audit Report on Defense Hotline Allegations Regarding the Military Airspace Management System (Project No. D2001AD-0187.00)

I appreciate the opportunity to review the subject draft report and provide the following responses to the IG recommendations to the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence).

Recommendation 1.a. "...Task the Air Force to establish a Military Airspace Management System In-Process Action Team with representation at the user level from all Services to conduct an analysis of the Military Airspace Management System to determine the most cost-effective scheduling program to meet DoD future airspace schedule, utilization, and report requirements."

OASD(C3I) reply: **CONCUR.**

Recommendation 1.a.b. Suspend any future installation of upgrades or technical refreshment efforts for the Military Airspace Management System until completing the cost-effectiveness analysis.

OASD(C3I) reply: **CONCUR.** We will only fund the Military Airspace Management System operations and maintenance costs until completion of the cost-effectiveness analysis.

Recommendation 2. "...Task the Army Deputy Chief of Staff for Operations and Plans; the Head, Airspace and Air Traffic Control, Department of the Navy; and Director of Operations and Training, Deputy Chief of Staff for Air and Space Operations, Headquarters U.S. Air Force to develop and implement policies and procedures to standardize the Special Use Airspace scheduling process."

OASD(C3I) reply: **CONCUR.**

If you have any questions or need further assistance, my POC is CAPT Hicks, she can be reached at (703) 607-0277 or email: lynne.hicks@osd.mil.


Francis X. Criste
Director, Communication Programs



Department of the Air Force Comments



**DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON DC**

**MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING
OFFICE OF THE INSPECTOR GENERAL
DEPARTMENT OF DEFENSE**

SUBJECT: Audit Report on Defense Hotline Allegations Regarding the Military Airspace Management System, 7 May 2002 (Project No. D2001AD-0187.00)

1. This is in reply to your memorandum requesting the Assistant Secretary of the Air Force (Financial Management and Comptroller) to provide Air Force comments on subject report.
2. The Draft Audit Report on Defense Hotline Allegations Regarding the Military Airspace Management System addressed seven allegations and made two recommendations. Attached are our comments on the allegations and recommendations.
3. If you have any questions reference these comments please contact my POC Capt Will Smith, HQ AF/XOO-RA, DSN 329 - 0215, commercial (703) 601-0215.

A handwritten signature in black ink, appearing to read "Charles F. Wald", is positioned above the typed name.

**CHARLES F. WALD, Lt Gen, USAF
Deputy Chief of Staff
Air & Space Operations**

Attachment:
AF Response to Audit Report on Defense Hotline Allegations Regarding the Military Airspace Management System (Project No. D2001 AD-0187.00)

Audit Report on Defense Hotline Allegations Regarding the Military Airspace Management System (Project No. D2001AD-0187.00)

Comments:

Allegation 1: Training for the system is insufficient (Partially Substantiated).

Concur with Comment. Originally, the Joint Program Office (JPO) Hanscom AFB provided funding for training. However, as resources became scarce, the JPO announced that funding for MAMS training would be eliminated and that training would have to be funded by individual Services or units. The Services objected to this approach as none had budgeted for the training and adequate funding was not readily available to accomplish the training. With the decommissioning of MASMS, an Air Force unique system, on 1 Oct 2000, the Services agreed to give a few of the USAF bases priority for training scheduled at Raytheon facilities in Lanham, MD prior to the MAMS Central Facility (MCF) standing up at Tinker AFB, OK in Oct 2000. This training began in July 2000 in order to give USAF adequate time to complete training and become familiar with the system once they returned to their home unit. Approximately 190 of the 200 slots available were filled during this training.

MAMS as well as most computer tools require a certain level of familiarity to maximize the training opportunity and the utility of the product. Several actions were required of the students prior to arrival at training in order to maximize the effectiveness of the training provided. The trainees needed: a valid MAMS account, and knowledge of the MAMS user Manual and their unit's airspace scheduling procedures. Not all attendees completed these actions, which sub-optimized the training. The training program was revamped in late 2000 and none of the above preparatory actions were required or expected.

The MCF established at Tinker AFB recognized the training for MAMS was not adequate and took positive steps to correct the deficiency. One of the first steps was to ensure students were prepared for training when they arrived at Tinker AFB, by reinstalling the aforementioned preparatory items left out by the training program revision in 2000. Additional steps included modifying the course content and handouts. The MCF's efforts have been successful, according to student critique forms collected by the MCF following training classes held at Tinker AFB. Since Jan 2001, responses indicate 86% of all students agreed that the course was the right length of time. Only 3 (out of 77) students felt their objectives were not met by the training courses.

Actions to be taken: Units will continue to fund the travel and per diem costs of students attending the training, until JPO can identify funding to provide training at no cost to the user.

Follow-up report due: None.

Allegation 2: Services and scheduling agencies are not using the system (Substantiated).

Concur. USAF units are not fully utilizing the system because of a malfunction of the MAMS conflict detection tool. Following identification of the discrepancy in the conflict detection tool, HQ USAF XOO, Director of Operations and Training issued a directive to the USAF to enter data into MAMS to exercise the system and capture airspace usage, while manually scheduling and deconflicting missions. The conflict detection tool discrepancy has been repaired and has proven reliable in testing and limited field use.

All new airspace scheduling systems under development will interface with MAMS through the Other DoD Scheduling Systems (ODSS) interface. Existing AF airspace-scheduling systems are in the process of being modified to utilize the ODSS interface. This approach is consistent with the MAMS CONOPS dated 1 September 1998.

Actions to be taken: Deputy Chief of Staff for Air Operations, Headquarters U.S. Air Force will continue to provide guidance that reflects the evolving airspace structure and MAMS. AF continues development of modifications to existing/new systems to interface with MAMS. Once interfaces are complete, MAMS will extract utilization data.

Follow-up report due: September 30, 2002.

Allegation 3: The program is being asked to do too many functions for too many different types of airspace (Substantiated). "Of 159 survey respondents, 105 or 66 percent, stated that MAMS did not have the functionality for them to do their job."

Do not Concur. According to the CONOPS "MAMS is a software tool that provides the capability to efficiently schedule airspace, accurately document utilization, interface with the FAA Special Use Airspace Management System (SAMS), and report the utilization of airspace to the FAA. MAMS performs those functions as well as identifies conflicts. Once individuals realized the utility of the system and information it stored they started submitting suggestions improving its ease of operation and attempting to expand the system to fulfill other requirements. Some of these suggestions include scheduling subsurface operations and tracking expended ordnance.

Numerous improvements have been made to MAMS in response to user requests. The MAMS Configuration Control Board (CCB) oversees the process to evaluate user comments and impact to the system. The CCB approves improvements that enhance the capability of the MAMS to meet its primary goals.

The MAMS CCB has reviewed a total of 131 user comments since their first meeting in Dec 2000. To date, 60 user comments have been implemented and closed, 28 are still in some state of development, and 9 remain on hold for future upgrades. In addition, the CCB reviewed a large number of problem reports to prioritize the actions to be taken. 463 (or 83%) of 558 problem reports logged since Sep 2000 have been corrected and closed. Corrective action on 55 problem reports is currently in development, and 10 problem reports remain on hold.

**SUMMARY OF MAMS PROBLEM REPORTS AND USER COMMENTS
SINCE SEP 2000**

	<u>CLOSED</u>	<u>REJECTED</u>	<u>ON HOLD</u>	<u>IN DEVELOPMENT</u>	<u>TOTAL</u>
<u>USER</u>	<u>60</u>	<u>34</u>	<u>9</u>	<u>28</u>	<u>131</u>
<u>COMMENTS</u>					
<u>% OF TOTAL</u>	<u>46</u>	<u>26</u>	<u>7</u>	<u>21</u>	<u>100</u>
<u>PROBLEM</u>	<u>463</u>	<u>30</u>	<u>10</u>	<u>55</u>	<u>558</u>
<u>REPORTS</u>					
<u>% OF TOTAL</u>	<u>83</u>	<u>5</u>	<u>2</u>	<u>10</u>	<u>100</u>

Additionally, MAMS offers several features designed to provide the scheduler more flexibility in scheduling their airspace and reduce their workload. As an example, airspace information in MAMS is the same as it is in the Flight Information Publications (FLIPs) and Digital Airspace Flight Information File (DAFIF). If airspace is subdivided in the FLIPs, it will be subdivided in MAMS and vice versa. The MAMS user (typically the Airspace Manager) may create dynamic airspace to accurately reflect actual use. An example is Sells Military Operations Area (MOA) (Sells 1/LOW). Sells MOA is published in the FLIPs as a single airspace, however, it is locally subdivided into 5 smaller areas to support the training requirements of the airspace users. The subdivisions are created dynamically in MAMS (by the user) and a relationship (called a dependency) is created with the larger Sells MOA. When a subdivision is scheduled, the dependency automatically causes the entire MOA to be scheduled, therefore, airspace schedule and utilization information is reported to the FAA in the required format.

Dynamic airspace can also work the other way. When several smaller areas are routinely scheduled together, a dynamic airspace may be created encompassing all the airspace and the dependency may be built so MAMS will schedule all the airspace by using the single, dynamic airspace.

Using dependency relationships, MAMS users may activate and deactivate multiple areas as a single entity, or a larger body of airspace as multiple sub-areas. Conflict detection and resolution follow similar rules, such that even if a user scheduled several dependent dynamic airspaces and there was a conflict, MAMS would only generate one alert.

Actions to be taken: None

Follow-up report due: None

Allegation 4: Many of the users do not have access to the proper computer equipment with Internet access (Unsubstantiated).

Concur.

Actions to be taken: None

Follow-up report due: None

Allegation 5: The time, money and effort utilized in building and training for the program is a waste (Partially Substantiated).

Do not Concur: MAMS is a top down driven acquisition in response to a GAO report of 1987, and performs four main tasks, schedules airspace, interfaces with the FAA SAMS, documents airspace utilization, and has the capability to report the utilization of airspace to the FAA.

MAMS was not intended to be the sole system to be used to schedule all Special Use Airspace, nor was it intended to meet every single user's unique needs. MAMS was built to give units an electronic capability where one did not exist, part of it includes a generalized scheduling tool that can be utilized by units. Additionally, the ODSS interface was designed to give the Services flexibility in meeting the Service/unit unique requirements.

Pursuant to the GAO report, the FAA and DoD have taken different approaches to meet their varying needs, while working together to establish an interface that transfers the required information between the organizations. The MAMS system interfaces with the FAA's SAMS system via the MAMS – SAMS interface. MAMS is the only system in existence that electronically communicates with SAMS.

MAMS can accurately track, compile, and produce annual utilization reports that comply with the format standards stipulated by FAAO 7400.2. MAMS accomplishes its four main tasks and is the only currently available system that performs all of those functions on a database that is as large and complex as the United States Special Use Airspace and Airspace for Special Use, therefore it is not a "waste".

Actions to be taken: None

Follow-up report due: None

Allegation 6: The scheduling process through the system is cumbersome and is time consuming compared to procedures already established (Substantiated).

Do not Concur. In order for MAMS to accurately document activity and produce reports, the data must be entered into the system at some point. Comparisons to outdated systems, or systems no longer in use, are not valid.

MAMS has the ability to accept batch entry via EXCEL spreadsheets, which greatly reduces workload. This upgrade was in response to user comments. It may take up to 5-10 minutes, or more for less experienced users, to create 10 missions in the main MAMS application (21 steps per mission). It takes less than 5 minutes to do the same via the spreadsheet. For units that already use a spreadsheet-based scheduling product, the process is even simpler. Luke AFB, for example, can import and approve over 160 missions (a typical daily schedule) in 15 simple steps that require only about two minutes to complete. The conflict detection process then runs in the background so the scheduler can go about other duties (even on the same computer system).

The Joint AFFSA-DoD Operational Requirements Document for a Military Airspace Management System AFFSA 001-85-I/II ACAT, DATED 20 Sep 93, Capabilities Require (4d), (2), Cost and Operational Effectiveness Analysis (COEA), states that 85% of the requests shall be accepted within 2 minutes (including communications time). Based on the above scenario, the per-mission request time is 1 minute, well within ORD parameters.

Differences in network load at various locations does have an impact on MAMS responsiveness, but poor connection speeds are a function of base infrastructure not a reflection of the MAMS system. There have been numerous memos addressing this issue. Additionally, the MCF can assist in identifying and resolving connectivity problems. Since 1 Oct 2000, the MCF Help Desk has taken only 12 calls from users reporting MAMS was running slowly. All of those reports were traced to problems with the network at the user's end. In the Luke AFB example above, running conflict detection on 160 missions at Luke AFB takes nearly 40 minutes, whereas the same schedule can be run at Tinker AFB in about 15 minutes. Additionally, the Mitre Corporation conducted a study in 1999 that addressed connectivity to MAMS. The study reported:

The Military Airspace Management System (MAMS) is an internet-based application used for scheduling and reporting the use of the Department of Defense (DoD) Special Use Airspace. This report details the results of a study undertaken to identify, with the MAMS end-to-end network, the source(s) of poor response experienced by some users. The conclusion was that if a user is experiencing significant and persistent delays, the source of the problem must be in the local communications infrastructure at the user's site. Analysis and timing measurements indicated that: (1) the MAMS server, (2) the communications infrastructure (including its links to the

Internet) at the MAMS Server site, or (3) the Internet itself, could not be the cause(s) of persistently poor performance.

Actions to be taken: None

Follow-up report due: None

Allegation 7: The utilization reports generated from the MAMS program are not sufficient to use for the reports we send to other agencies requiring similar but more detailed information (Substantiated).

Do not Concur. MAMS was designed to meet the airspace reporting requirements of Federal Air Regulation (FAR)-73 and FAA Order 7400.2, Ch. 21, Sect 7. The ODSS interface was created to allow Service unique requirements to be met by other existing/future systems while allowing MAMS to extract the utilization data. Different airspace may have additional reporting, accounting and tracking requirements based on their usage and chain of command. MAMS also provides a custom report capability wherein an airspace manager can design a report tailored to meet that unit's requirements. The Concept of Operations (CONOPS) for the Military Airspace Management system (MAMS) dated 1 September 1998 states that "The mission of MAMS is to provide computer-based support for efficient management of DoD airspace and for documentation of airspace utilization".

Actions to be taken: None

Follow-up report due: None

DoD IG Recommendation:

A. We recommend that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) task the Air Force, as the executive agent for the Military Airspace Management System, to:

1. Establish a Military Airspace Management System In-Process Action Team that includes representation at the user level from all Services to conduct an analysis of the Military Airspace Management System and determine whether it is the most cost-effective scheduling program to meet DoD future airspace schedule, utilization, and report requirements. The In-Process Action Team should:

- a. Identify each Service's future requirements for Special Use Airspace scheduling, utilization, and reporting;**
- b. Evaluate any new technology available for scheduling and reporting utilization data of Special Use Airspace to the Federal Aviation Administration; and**
- c. Consider whether it would be more cost effective if each of the Services use their current scheduling system and develop an interface directly with the Federal Aviation Administration.**

2. Suspend any future installation of upgrades or technical refreshment efforts for the Military Airspace Management System until completing the cost-effectiveness analysis.

Concur With Comment

The AF concurs with the establishment of a Military Airspace Management System In-Process Action Team. This Team should become a function of the established PBFA Airspace Sub-Group. Representation from the user level from all Services should be included in this team as well as additional expertise as needed to determine available technology and assist with cost effectiveness analysis. This team should also establish guidance to ensure adequate funding is procured to support the most cost effective Military Airspace Management System.

Even if proven cost effective the AF would be hesitant to concur with other Services interfacing directly with the FAA, due to safety concerns. As Services continue to manage their SUA more effectively, and the demand for SUA increases more Services will utilize other Services airspace instead of acquiring Service specific airspace to fulfill their requirements. MAMS assists the Services in deconflicting airspace

schedules before sending them to the FAA. This enables the FAA to refer to one sole source of information, instead of several to determine the status of SUA.

The MAMS – FAA Special Use Airspace Management System (SAMS) interface is the only electronic gateway in existence that interfaces the military airspace scheduling systems with the FAA SAMS system. The SUA schedule information provided to the FAA via the MAMS –SAMS interface is a critical element in the FAA's National Airspace System modernization effort. The FAA provides the commercial users of the system this SUA schedule information, which enables aircraft operators to flight plan the most efficient routes around active SUA.

The AF concurs with suspending the installation of any major upgrades for MAMS until completing the cost-effectiveness analysis. However, minor upgrades and technical refreshment efforts are required to ensure the system can continue to interface with the SAMS and remains operational. MAMS was built with Commercial Off The Shelf (COTS) components and software to save initial costs. As the components and software age, the vendors stop supporting them in order to support their new products. Therefore, it is imperative that MAMS is upgraded at the same pace of technological innovation to ensure it remains supportable and does not fail for any period of time. Previous leadership recognized the importance of upgrading software and specifically added a portion to the MAMS Concept of Operations, signed 1 Sep 98, stating the MCF will maintain COTS equipment and software and will perform software upgrades in response to user requirements.

The estimated completion date of the MAMS In-Process Action Team evaluation is July 2003.

DoD IG Recommendation:

B. We recommend the Assistant Secretary of Defense (Command, Control, and Communications, and Intelligence) task the Army Deputy Chief of Staff for Operations and Plans; the Head, Airspace and Air Traffic Control, Department of the Navy; and Director of Operations and Training, Deputy Chief of Staff for Air and Space Operations, Headquarters U.S. Air Force to develop and implement policies and procedures to standardize the Special Use Airspace scheduling process.

Concur.

The Air Force already complies with this recommendation. According to the DoD Draft Audit, Section, "Factors Effecting Use and Acceptance of MAMS" subsection, "Service Policies for Standardizing Scheduling Process" "With the exception of the Air Force, the other Services lacked policies and procedures for standardizing their SUA schedule process."

Deputy Chief of Staff for Air Operations, Headquarters U.S. Air Force will continue to provide guidance that reflects the evolving airspace structure, and technological advances.

Audit Team Members

The Acquisition Management Directorate of the Office of the Assistant Inspector General for Auditing of the Department of Defense prepared this report. Personnel of the Office of the Inspector General of the Department of Defense who contributed to the report are listed below.

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